Tightening environmental regulations and their financial implication for transport

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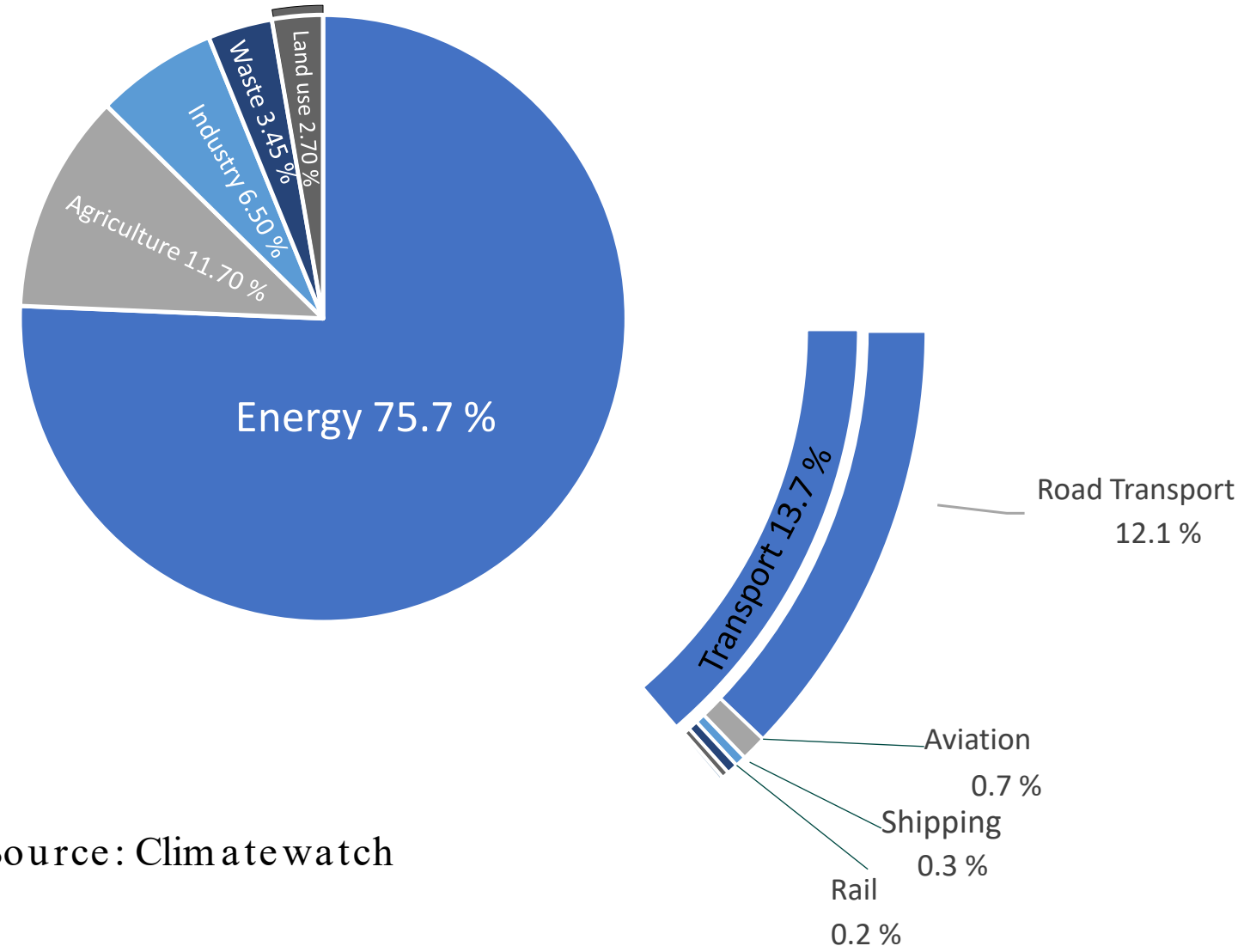
Shipbuilding, sustainable development and material management -seminar

Turku, 25.11.2025

Global greenhouse gas emissions by sector (2021), total 53.2 billion tonnes CO_2eq.



Transport accounts for roughly 13.7% of greenhouse gas emissions.

Data Source: Climatewatch

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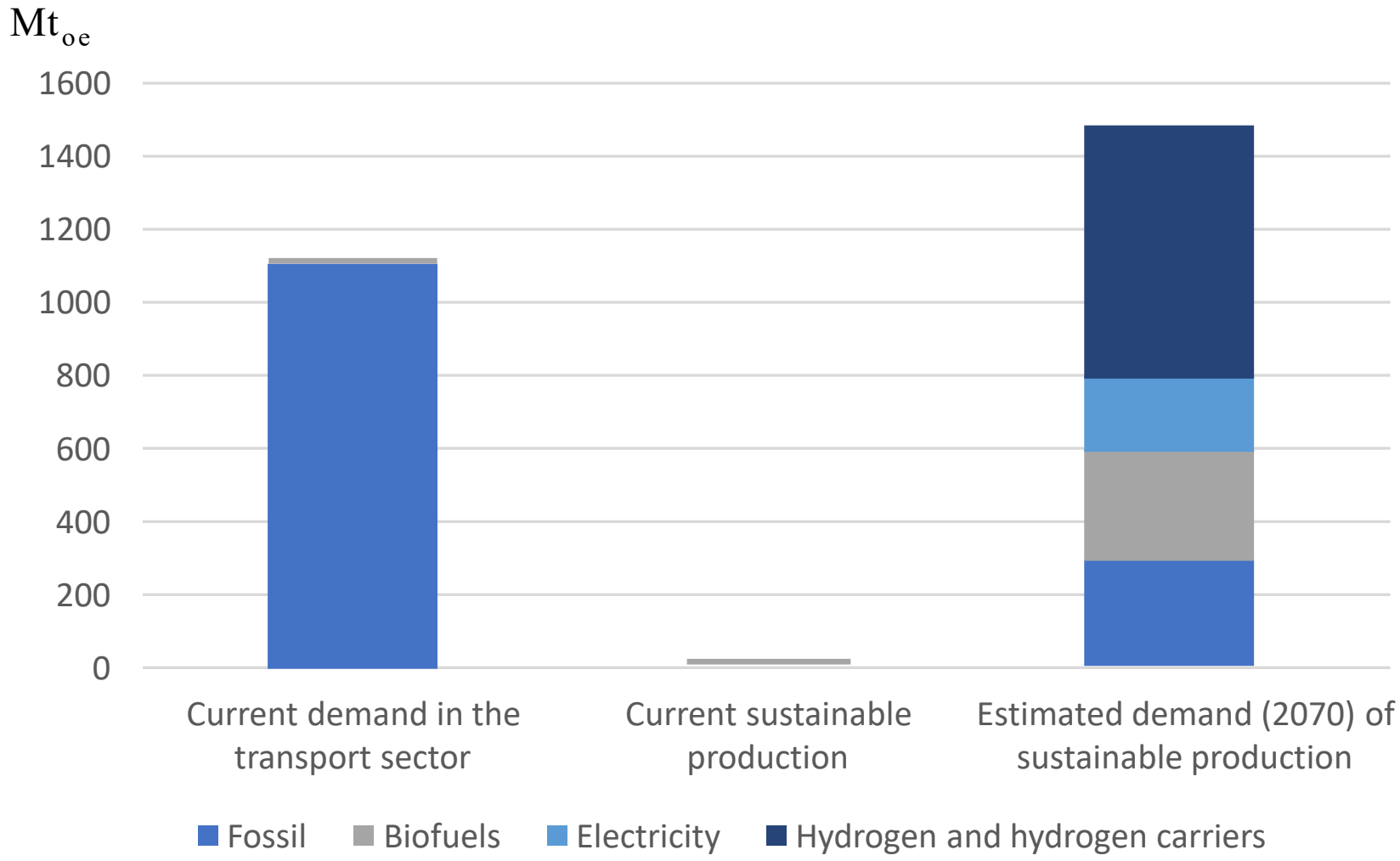
Current and future energy demand of transport



Data source: IEA 2020

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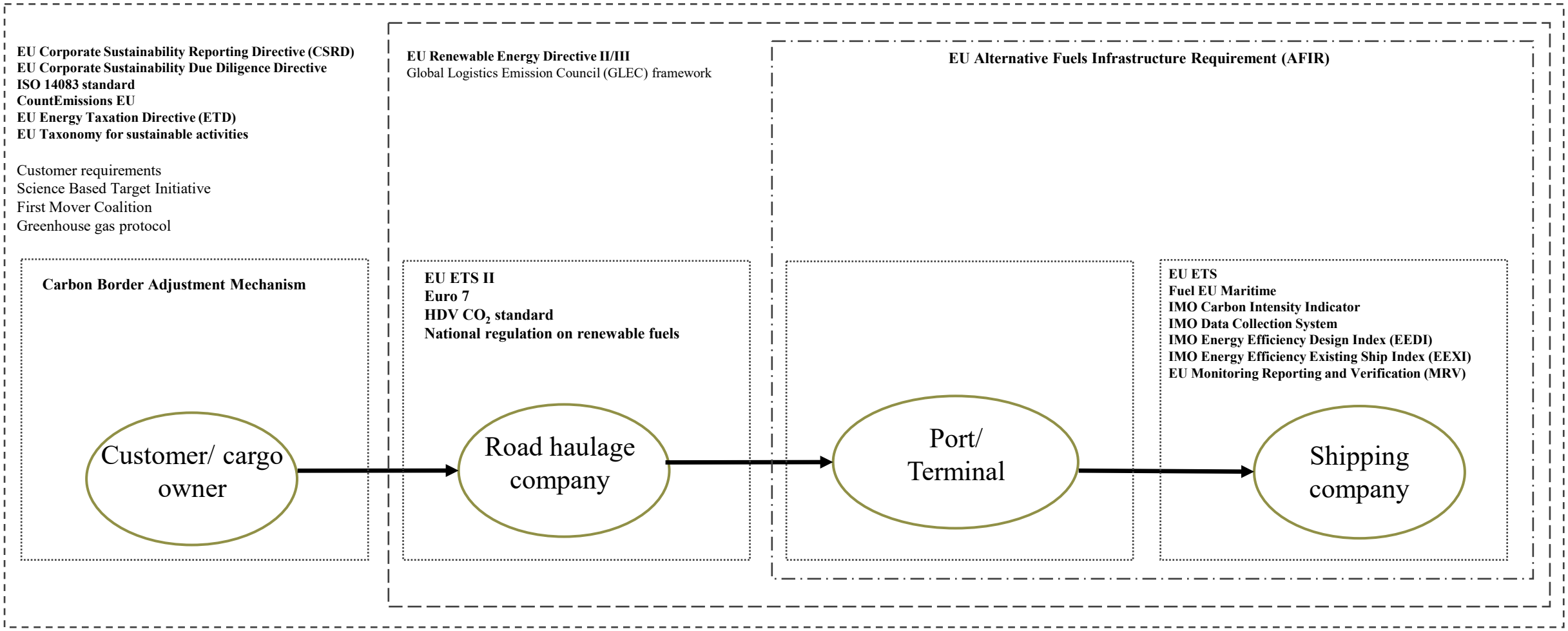
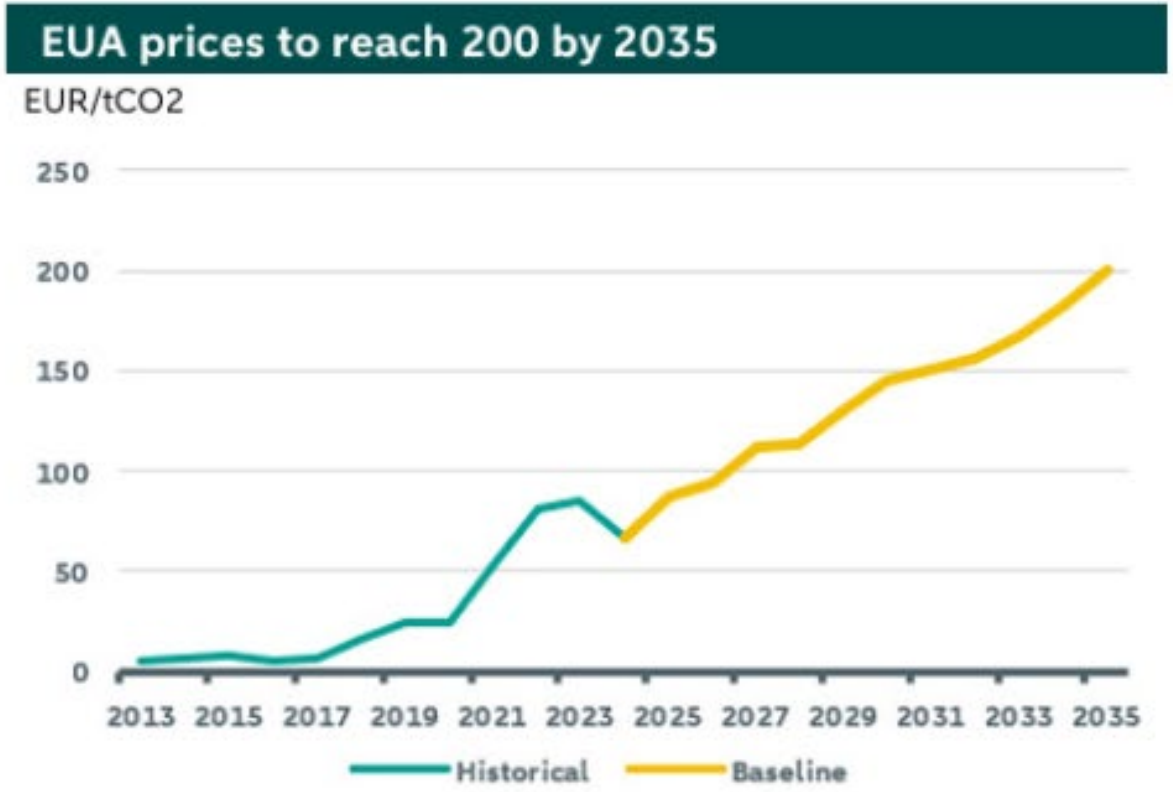
Environmentally motivated regulation and initiatives for different parts of transport chain (**REGULATION, VOLUNTARY**)

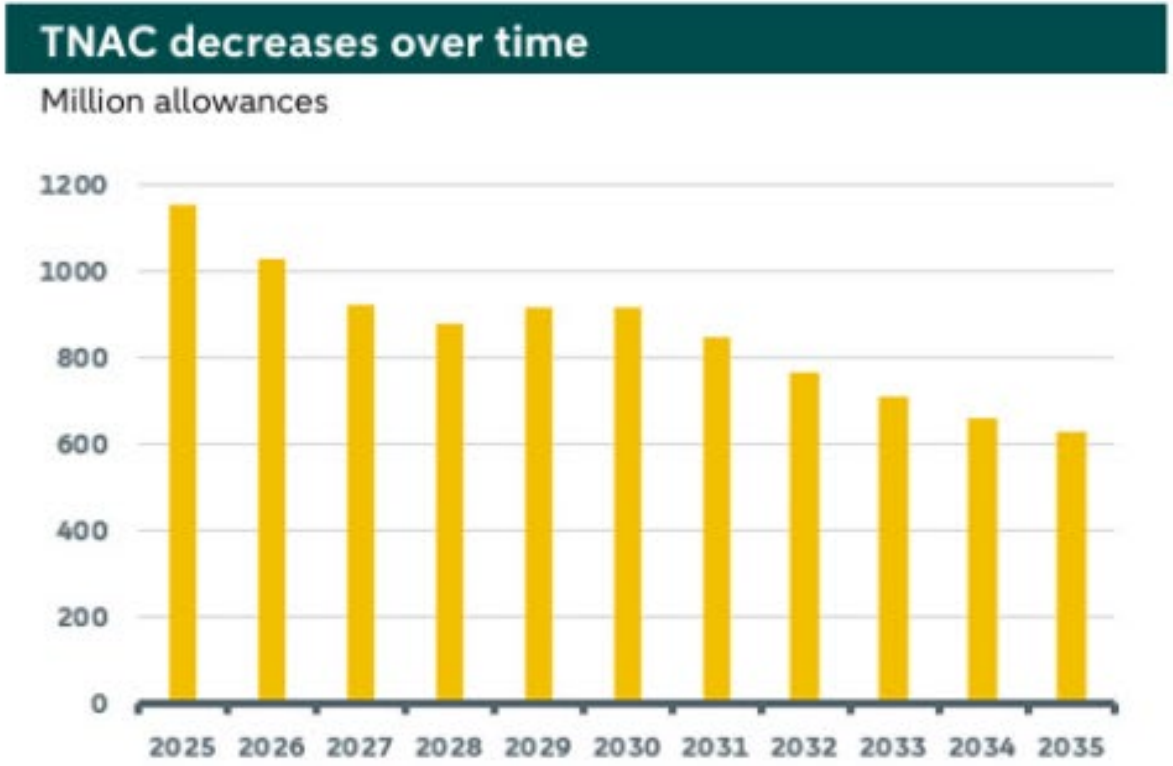


Regulation/ voluntary

Solakivi et al. 2025

EU ETS-prices forecasted to increase as cap diminishes





ABN AMRO 2025

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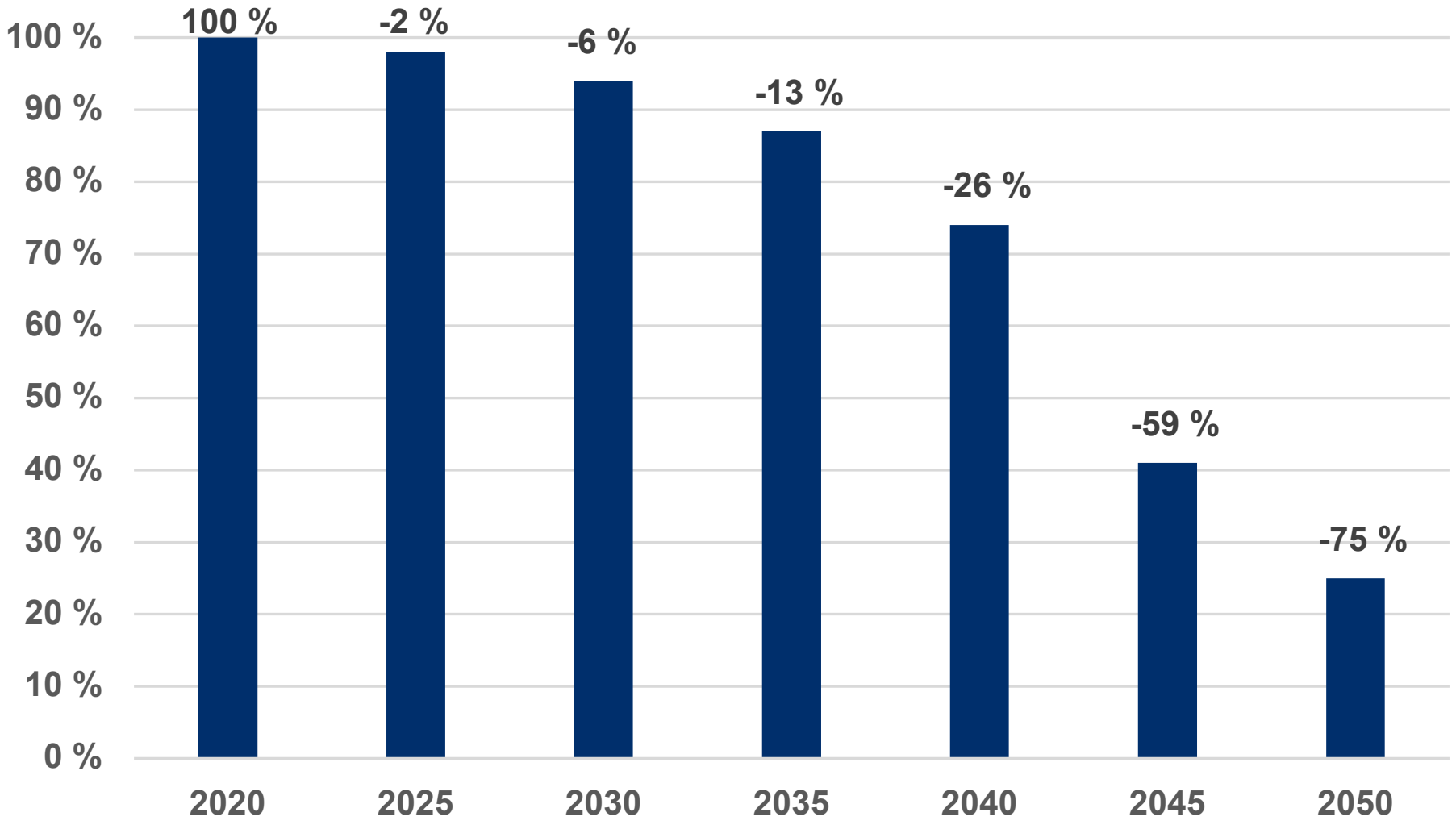
FuelEU Maritime: Tightening limits for carbon intensity of maritime fuels



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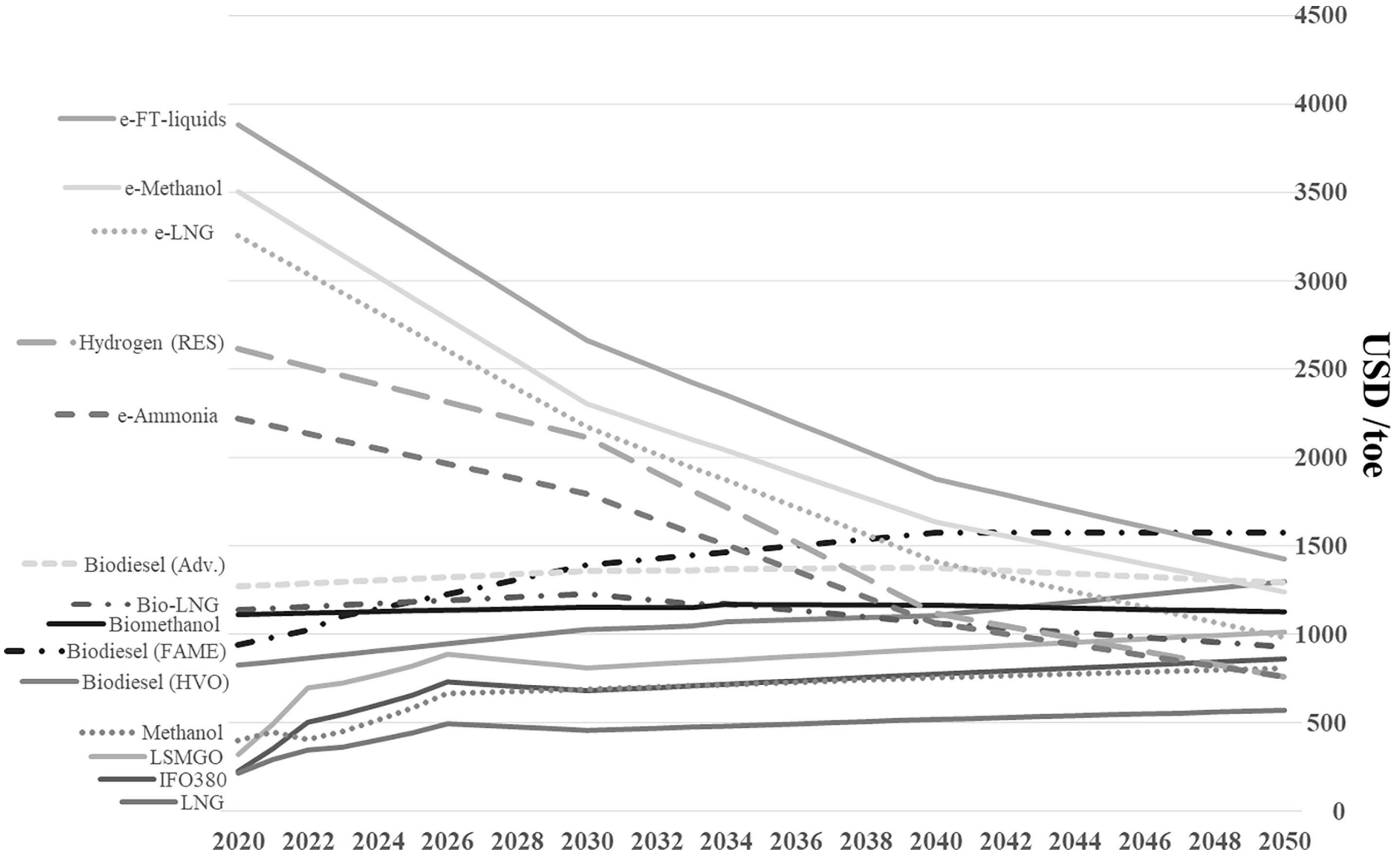
Long term forecasts of marine fuel prices indicate that low-carbon fuels will remain expensive



Solakivi et al. 2022

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In addition to fuel cost, also investments are needed

Fuel specific WTW data (GHG, Energy usage, Fuel cost and CAPEX).

				New built cost			Fuel Cost			
		LCV	WTW Power (Input / Output)	Engine	Tanks and add-ons such as scrubber	Total Capex	Low	High	Low	High
		MJ/ kg	*MJ/MJ*	*USD/ kW*			*USD / TOE*		*USD / GJ*	
MGO	Diesel	42.7	2.4	400	0	400	500		12.0	
Liquid Hydrogen (NG)	Dual Fuel Diesel	120.0	4.5	1500	1200	2700	1 100		26.3	
E-Liquid Hydrogen	Fuel Cell	120.0	5.0	1500	1200	2700	925	1 750	22.0	41.6
Ammonia (NG)	Dual Fuel Diesel	18.6	3.8	800	600	1400	1 100		26.3	
E-Ammonia	Dual Fuel Diesel	18.6	4.2	800	600	1400	940	1 750	22.0	41.0
E-LNG	Dual Fuel Diesel	49.2	6.2	800	600	1400	1 350	3 000	31.2	69.3
E-LNG	Dual Fuel Otto	49.2	6.1	400	600	1000	1 350	3 000	31.2	69.3
E-Methanol	Dual Fuel Diesel	19.9	6.5	600	200	800	1 360	3 235	31.2	74.2
E-Diesel	Dual Fuel Diesel	42.7	7.1	400	0	400	1 530	3 575	35.0	81.8

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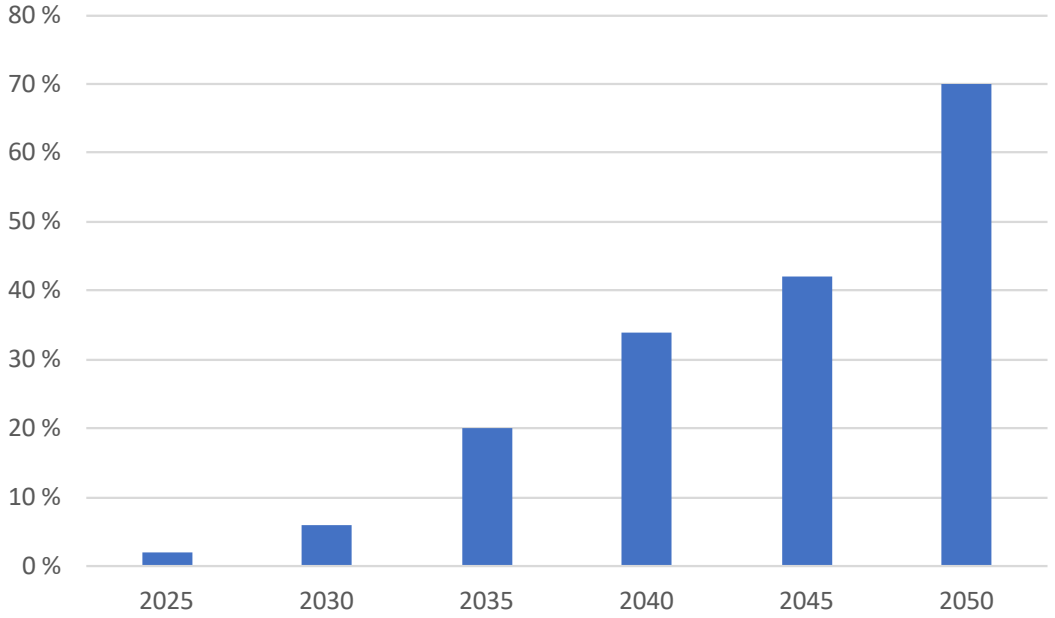
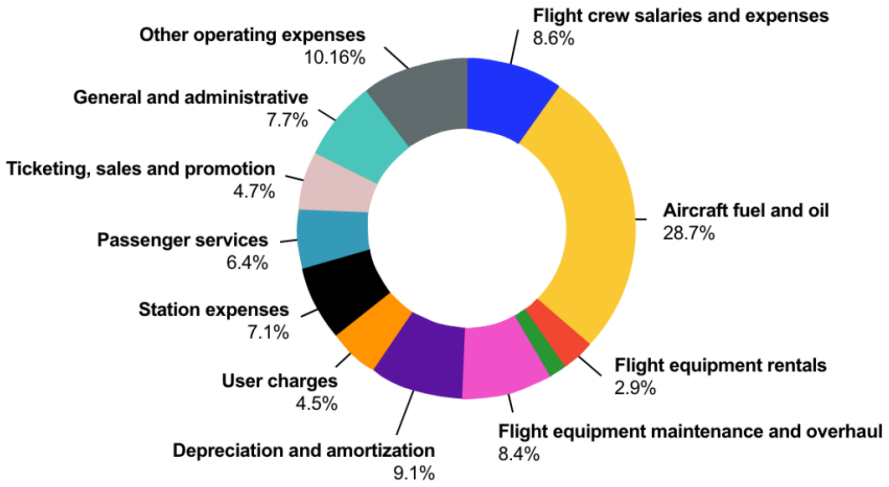
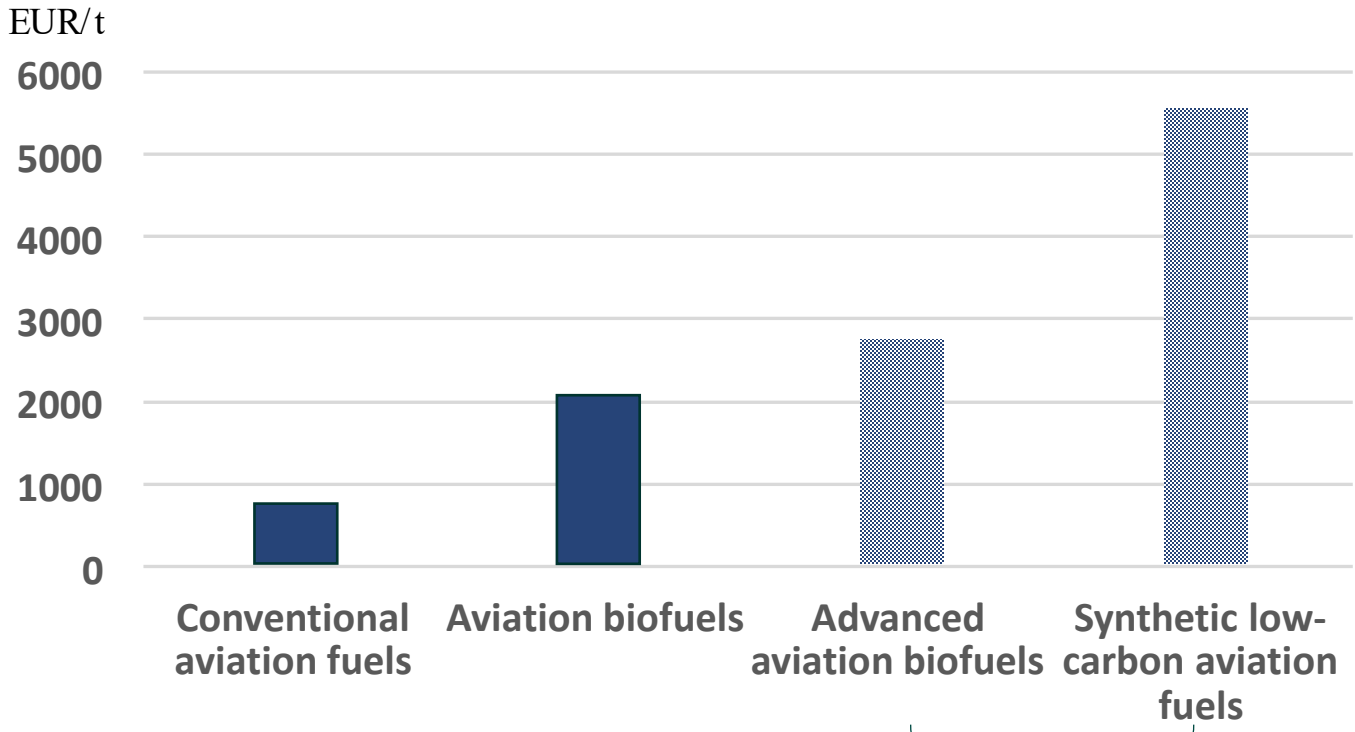
ReFuelEU Aviation SAF Quota





IATA 2025



EASA 2025

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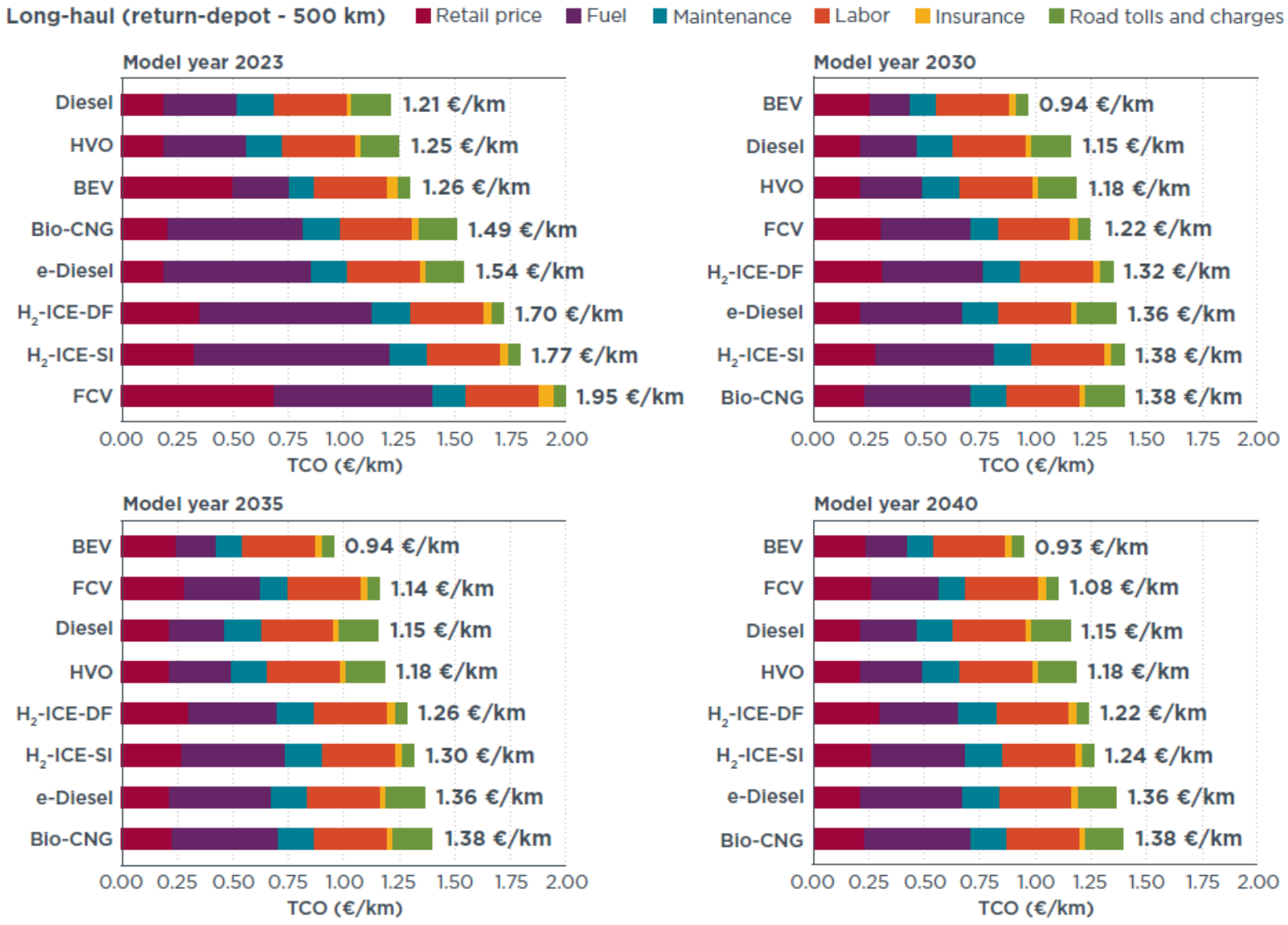
In road transport, cost efficient solutions expected already in the nearest future



Basma & Rodrigues, 2023

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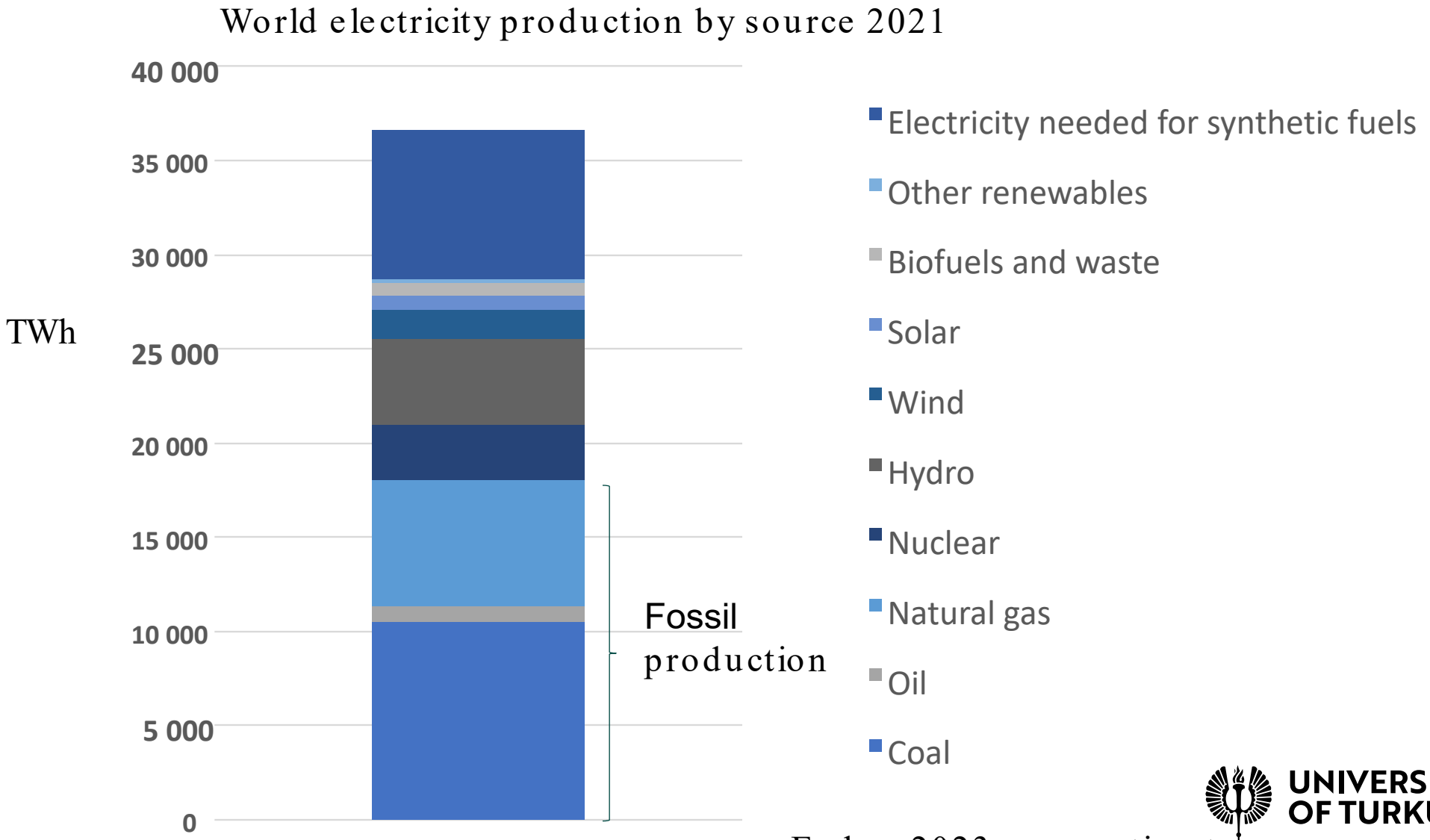
Complying with regulation is not a transport problem, it is an electricity production problem



Ember 2023, own estimate

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Some conclusions

- Transport accounts for 13.7% of global greenhouse gas emissions
- Transport is one of the ”hard to abate”–sectors, highly dependent on fossil fuels
- At the same time transport is one of the sectors where emissions are expected to increase together with economic growth
- Internalizing the externalities is not considered sufficient, and many regulations aim for technology and fuel change

Some conclusions

- Depending on mode, technological or commercial viability of mitigation methods is on a different level
- Road transport most likely to reduce emissions cost efficiently, whereas in long distance transport (shipping and aviation) complying with regulation and reducing emissions will be costly for a long time
- Complying with regulation is not a transport problem, it is an energy production problem

Get inspired.

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